Reprinted from JOURNAL OF INVERTEBRATE PATHOLOGY

JOURNAL OF INVERTEBRATE PATHOLOGY 18, 301–303 (1971)

Volume 18, No. 2, September, 1971
Printed in U.S.A.

Exoskeletal Intrusions: A Wound Repair Process in Penaeid Shrimp[1]

A standard mark for penaeid shrimp is the Petersen disc tag (M. J. Lindner and W. W. Anderson, *U. S. Fish Wildl. Serv., Bull.* **56,** 555–645, 1956) which is inserted through the abdomen, between the first and second segments (Fig. 1a), and creates a large, open wound. Lindner and Anderson recognized the high mortalities associated with this tag, as did Neal (*U. S. Fish Wildl. Serv. Circ.* **295,** 1–15, 1968; *FAO Fish. Rep.* **57**(3), 1157, 1969) who described the high incidence of fatalities with this external tag and attributed the low survival to improper exoskeletal healing which resulted in infection within 2 weeks. This paper presents the results of a study designed to determine grossly the wound repair process of the shrimp which survive this marking technique.

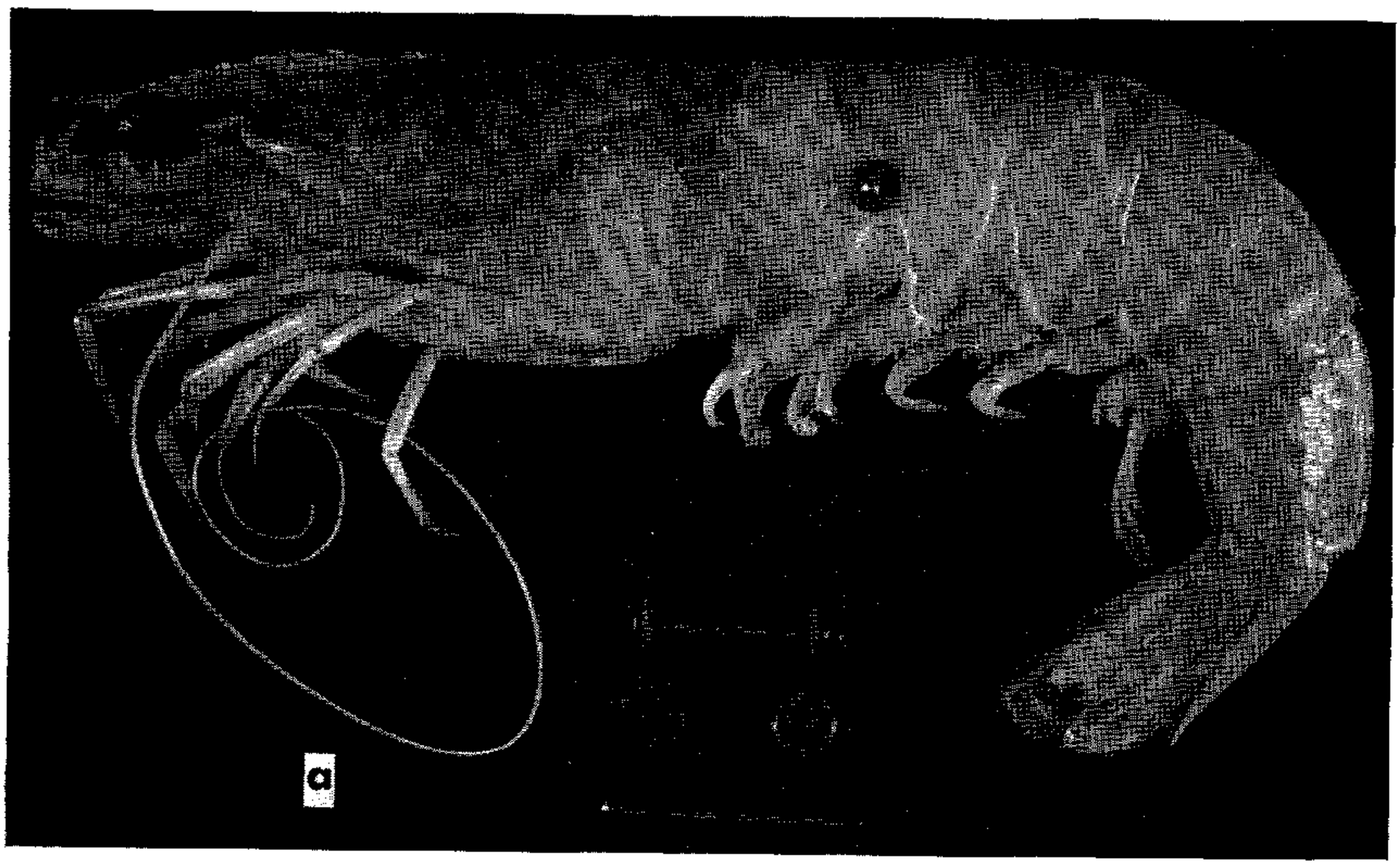


FIG. 1. (a) brown shrimp, *Penaeus aztecus*, tagged with the Petersen disc tag; (b, c, d, e) exoskeleton segments from shrimp at 5, 10, 29, and 41 days after tagging in the laboratory; (f) exoskeleton segment from shrimp recaptured 132 days after tagging.

Brown shrimp, *Penaeus aztecus*, were tagged in the laboratory, and each day after tagging one shrimp was removed and examined. Exoskeleton intrusions were noted at the point of entrance and exit of the pin by the 4th day after tagging. The intrusions around the pin were distinct on the 5th day (Fig. 1b—the black inward projections are the beginning of the exoskeletal tube around the pin), had progressed almost one-half the

[1] Contribution No. 321, National Marine Fisheries Service Biological Laboratory, Galveston, Texas 77550.

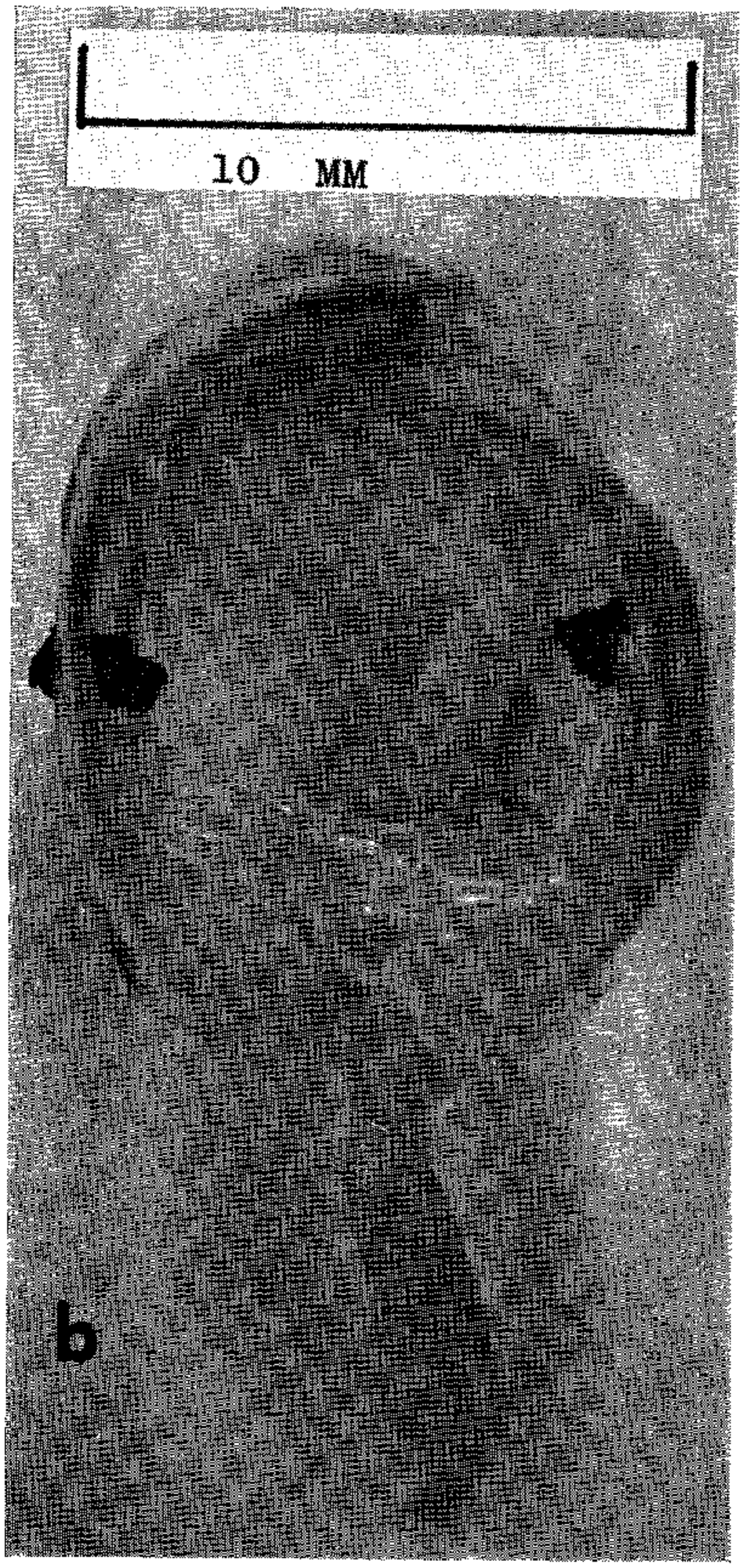


FIG. 1B.

length of the pin by the 10th day (Fig. 1c), and were fused, forming a complete tube, by the 29th day (Fig. 1d—the tube was broken during removal). The tube was evident in all shrimp examined after the 29th day and by the 41st day was a well-formed exoskeletal structure (Fig. 1e—the left side and ventral portions of the exoskeleton were removed to show the involuted characteristic of the tube).

To determine whether this phenomenon occurs in shrimp released in natural situa-

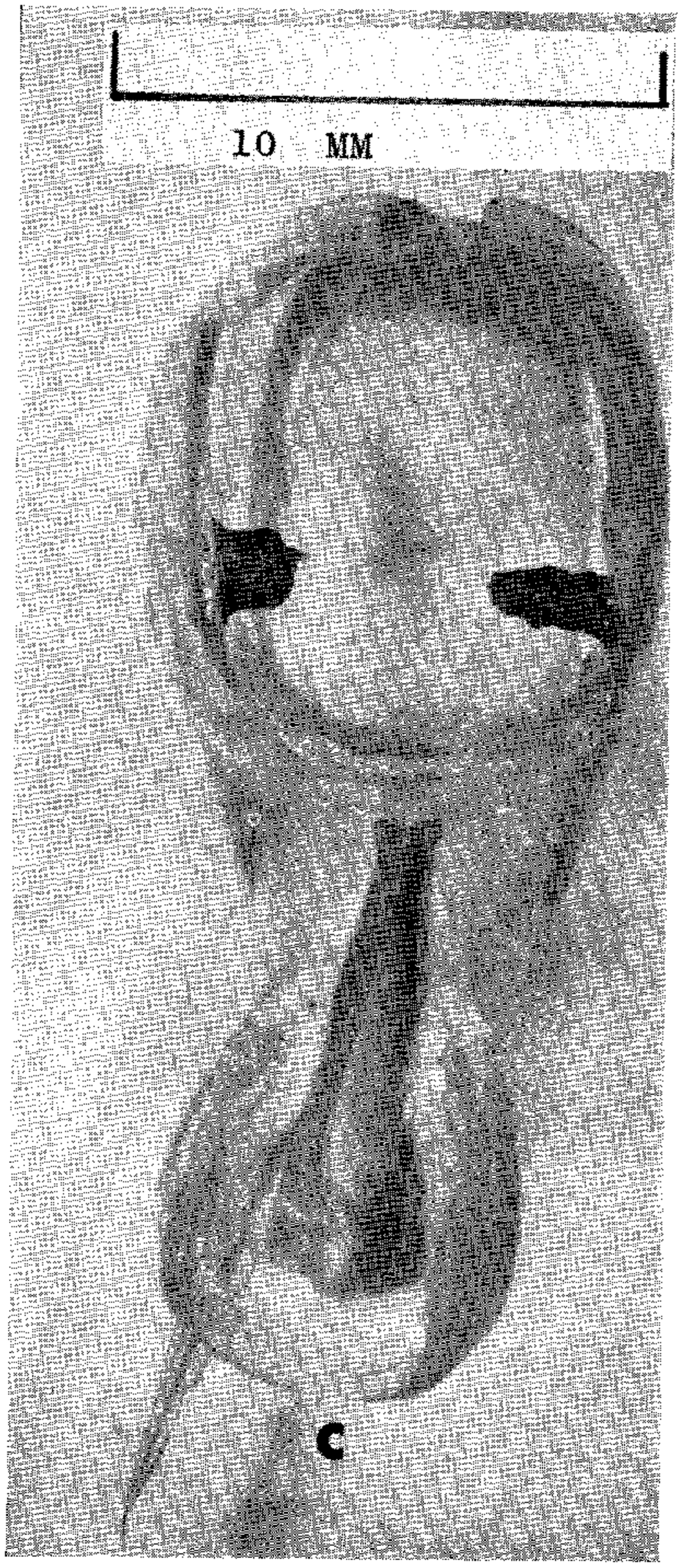


FIG. 1C.

tions, a group of 142 brown shrimp, recaptured from a mark-release study, were examined. The involuted exoskeletal tube was detected in 117 of the field recaptures. When present, the intrusions were well developed, yet none were fused to form a complete tube as did those observed in the laboratory (Fig. 1f—segment of exoskeleton

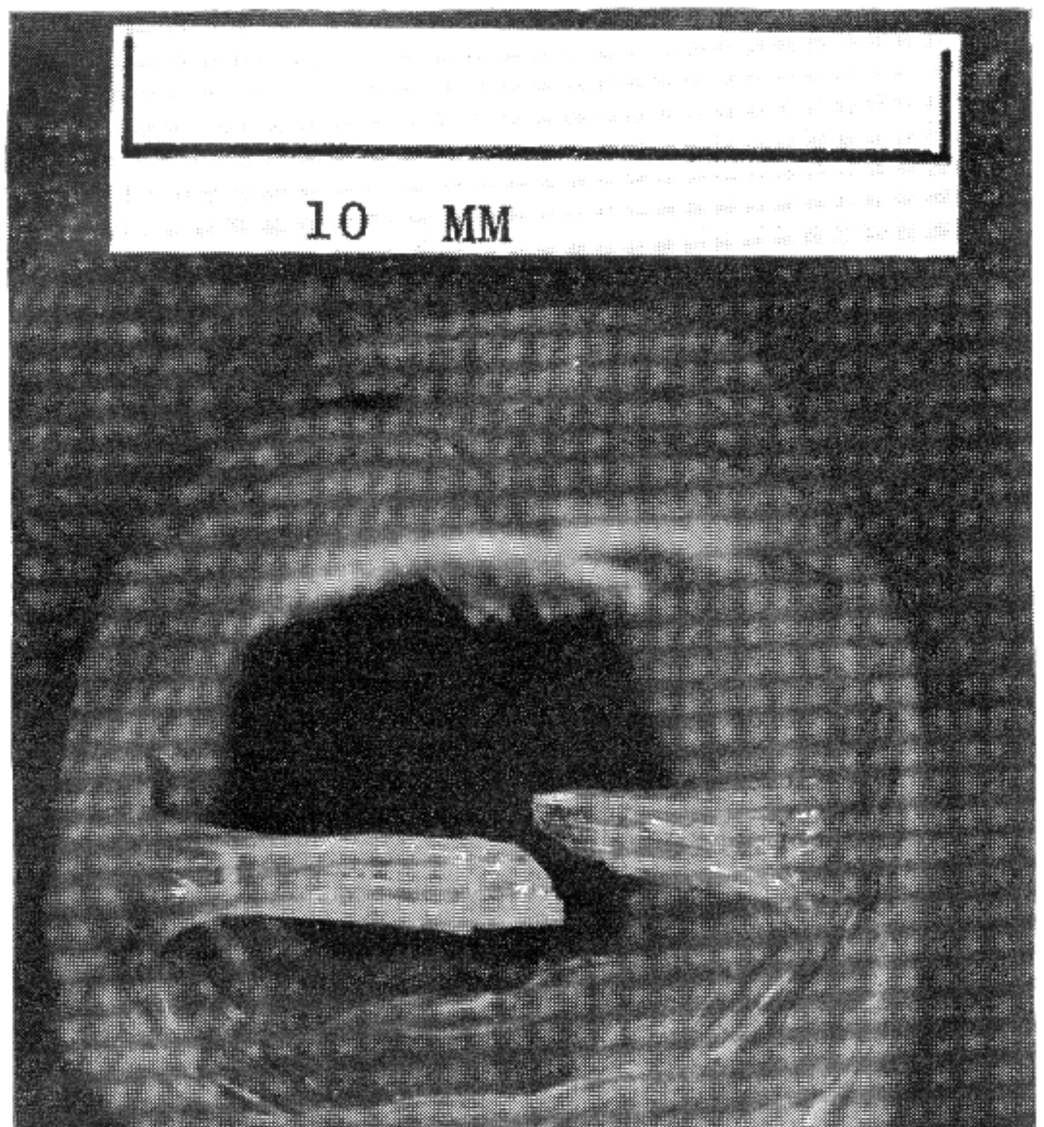


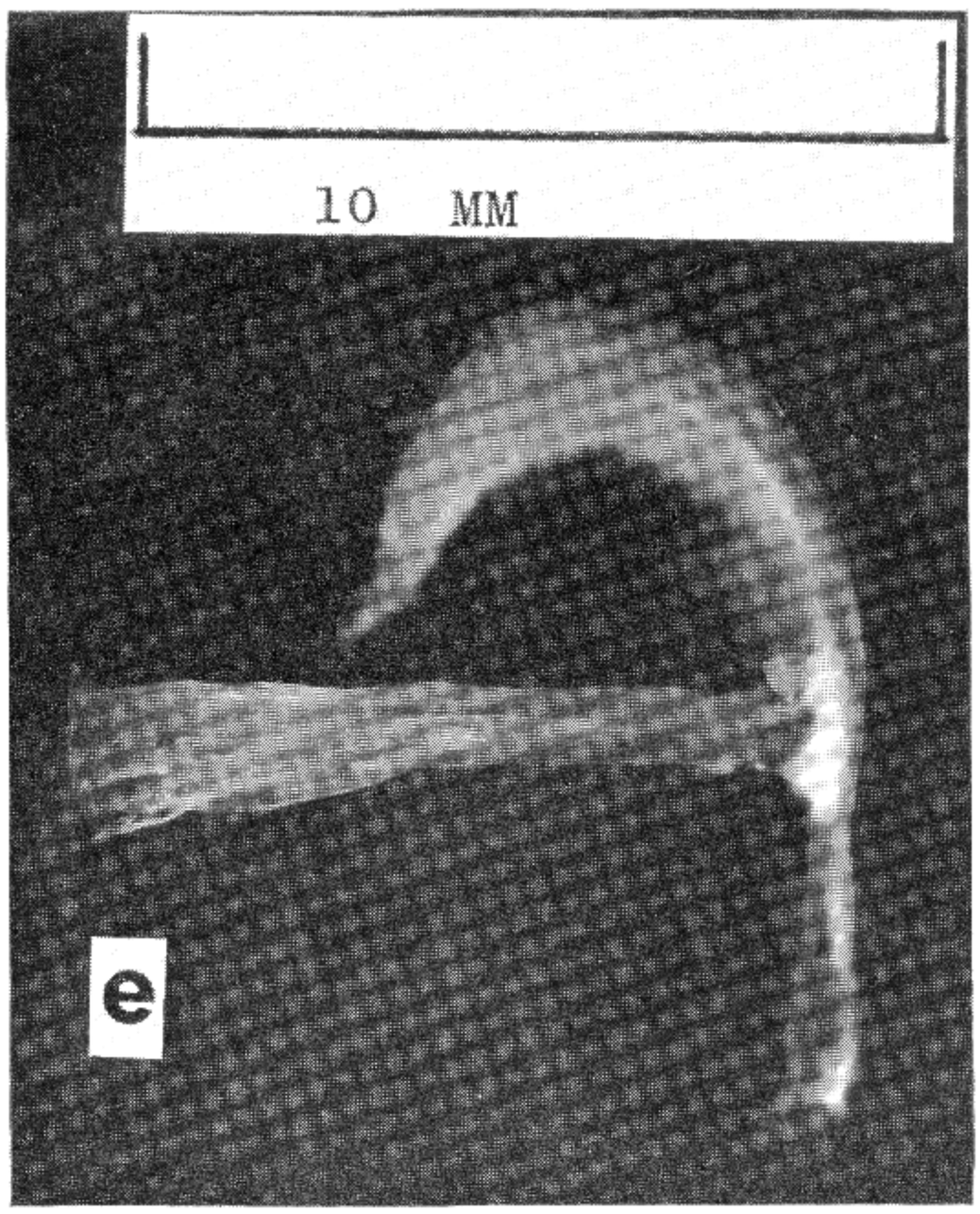
FIG. 1D.

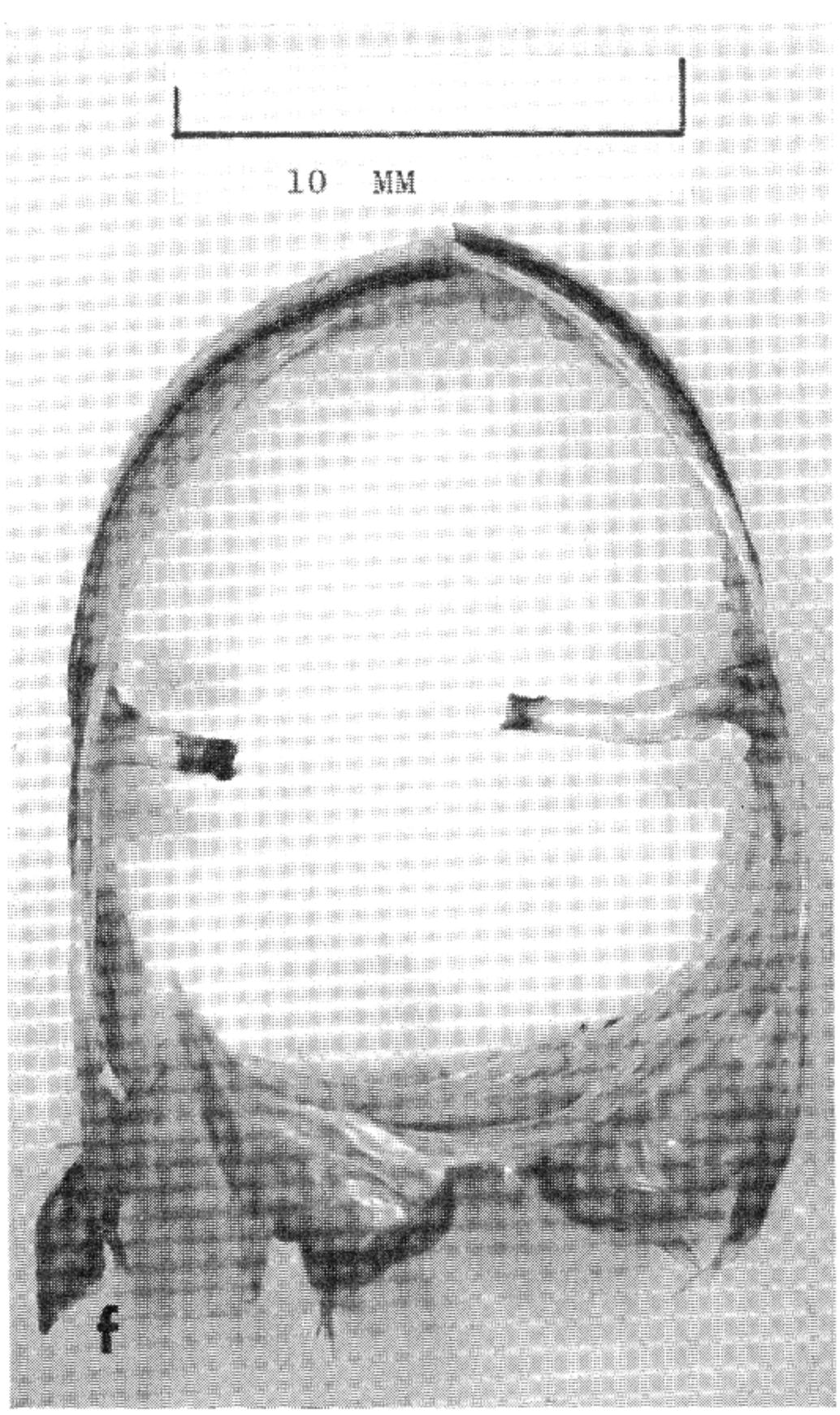
from shrimp recaptured 132 days after tagging).

It is apparent from examination of field and laboratory tagged brown shrimp that an effective "open encapsulation" is formed around the Petersen disc tag pin by exoskeletal intrusions. The long-term survival of penaeid shrimp tagged by this method is evidently related to the success of this wound repair process.

CLARK T. FONTAINE
National Marine Fisheries Service
Biological Laboratory
Galveston, Texas 77550

Received March 26, 1971





FIGS. 1E and 1F.